Topic 17 – Electrophysiology, rythmology and pacing – B

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0305

Heterogeneous conduction properties in the pig right ventricle

David Benoist (1), Virginie Dubes (1), Sabine Charron (1), Stephen Gilbert (2), Charly Belterman (3), Marion Constantin (1), Jérôme Naulin (1), Julie Magat (1), Valéry Ozenne (1), Caroline Rooryck-Thambo (4), Bruno Quesson (1), Michel Haïssaguerre (1), Ruben Coronel (5), Olivier Bernus (1)
(1) Université de Bordeaux, IHU LIRYC, INSERM U1045 CRCTB, Pessac, France – (2) Max Delbrück Center for Molecular Medicine, Berlin, Allemagne – (3) Academic Medical Center, Amsterdam, Pays-Bas – (4) CHU Bordeaux, Université de Bordeaux, E.A. 4137 MRGM, Bordeaux, France – (5) Academic Medical Center, IHU LIRYC Amsterdam, Pays-Bas

The right ventricular outflow tract (RVOT) has a distinct embryological origin and is a common anatomical source of arrhythmias in the healthy and diseased myocardium. We hypothesised that specific RVOT activation and conduction properties may underlie the preferential RVOT origin of arrhythmias. Pig right ventricular (RV) wedge preparations were perfused via the left anterior descending and right coronary arteries. Electrical activation and conduction properties were obtained by optical mapping of the epicardial surface (di-4-ANEPPS 10μM) upon electrical stimulation of the preparation. Transmural needles were inserted in the RV free wall and RVOT and unipolar electrograms (EGMs) were recorded. Fiber orientation was obtained by diffusion tensor MRI. Regional mRNA expression was determined by RT-PCR and fibrosis was assessed histologically. Longitudinal and transverse conduction velocities were significantly reduced in RVOT compared to RV free wall (P<0.01). A different direction of propagation was observed in the RVOT compared to the RV free wall and a line of slowed propagation was found at the interface between the 2 regions. This was consistent with a 135±2° change in fiber orientation observed between the 2 regions within a restricted distance (<6cm). The RVOT showed more sites with fractionated EGMs (P<0.01) and more deflections per electrode (P<0.001) than the RV free wall. In line with these findings, a decreased expression of Scna5 and Gja1 was found in the RVOT compared to the RV free wall (P<0.001). Moreover, the RVOT was characterized by an upregulation of type I collagen mRNA, a higher collagen content (P<0.05) and the presence of fat infiltrations which were absent in the free wall.

Conduction is slower in the pig RVOT and is associated with fractionated unipolar electrograms. Conduction slowing was related to (i) reduced connexin and sodium channel expression and (ii) region-specific structural properties which may generate a substrate for RVOT arrhythmias.

0230

Effectiveness of extracorporeal life support for patients with cardiogenic shock due to intractable arrhythmic storm

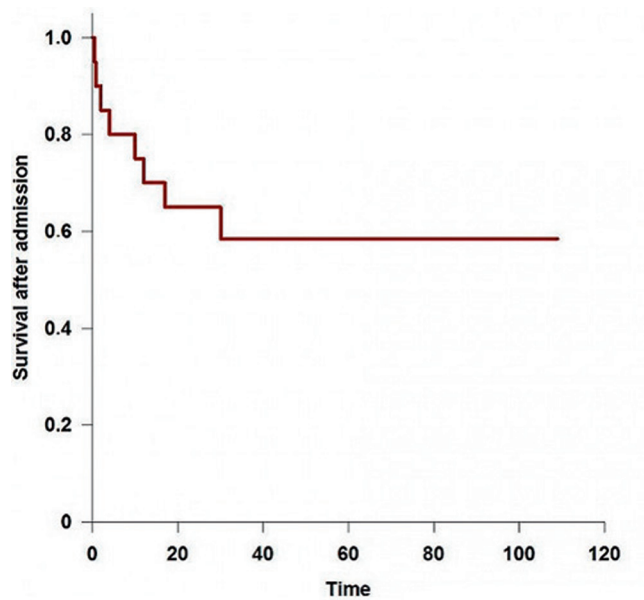
Solene Le Pennec-Prigent (1), Raphaël Martins (1), Céline Chabanne (1), Bernard Lelong (1), Jean-Claude Daubert (1), Christophe Leclercq (1), Philippe Mabo (1), Erwan Flecher (2)
(1) CHU Rennes, Cardiologie, Rennes, France – (2) CHU Rennes, Chirurgie Thoracique et Cardio-Vasculaire, Rennes, France

Background: Extracorporeal life support (ECLS) provides mechanical cardiopulmonary support and has been used for intractable heart failure as a bridge to heart transplantation or to recovery. Intractable arrhythmic storm is associated with high mortality. Little is known about the effectiveness of ECLS to treat refractory ventricular arrhythmias responsible for cardiogenic shock in patients non eligible for an urgent ablation.

Methods: Patients with intractable refractory ventricular arrhythmias and cardiogenic shock despite optimal medical therapy, and treated by ECLS implantation were retrospectively included. Patients' characteristics and outcome were analyzed.

Results: 20 patients (53±10 yo) were included. The underlying etiology to the refractory ventricular storm was ischemic cardiomyopathy (75%), short coupled Torsades de Pointes (10%), dilated cardiomyopathy (5%), myocarditis (5%) or unknown (5%). Mean LVEF was 33±17%. An average of 2.3±1.2 anti-arrhythmic drugs was tried before implantation. Arrhythmic storm stopped after a median time of 15min after ECLS implantation. 8 patients (40%) eventually died, none of them because of a complication of ECLS implantation. The remaining 12 patients (60%) had ECLS withdrawn after a median time of 5.3 days, and were discharged after a median time of 29 days after admission (survival curve in the figure).

Conclusion: This is the largest database of patients temporary implanted with ECLS for refractory ventricular arrhythmia responsible for cardiogenic shock and non eligible for ablation. It provides efficient hemodynamic support to these critically ill patients, and survival rate after the implantation is 60%.



Abstract 0230-Figure: Survival curve

0334

Implantable cardioverter defibrillator in primary prevention for chronic heart failure: incidence and predictors of appropriate therapy

Arsène Monnier (1), François Lesaffre (1), Pierre Nazeyrollas (1), Aurélie Marchais (2)
(1) CHU Reims, Hôpital Robert Debré, Cardiologie, Reims, France – (2) CH Troyes, Cardiologie, Troyes, France

Background: Considering morbidity and financial impact on the health care system, it may be helpful to stratify patients who would most benefit from primary ICD treatment. The aim of this study was to assess the prevalence and identify the clinical predictors of appropriate ICD therapy in patients following implantation of an ICD in primary prevention for chronic heart failure.

Methods: A monocenter retrospective analysis was performed and all patients undergoing implantation of ICD in primary prevention were included. Device interrogations were performed and appropriate therapies, either ATP or shock, were noticed.

Results: Over the 317 primary prevention patients undergoing ICD implantation, 203 had ischemic cardiomyopathy (ICM) and 114 had non-ischemic dilated cardiomyopathy (NIDCM). At the median follow-up time 760±599 days, 56 (17,7%) had received appropriate ICD therapies. Average